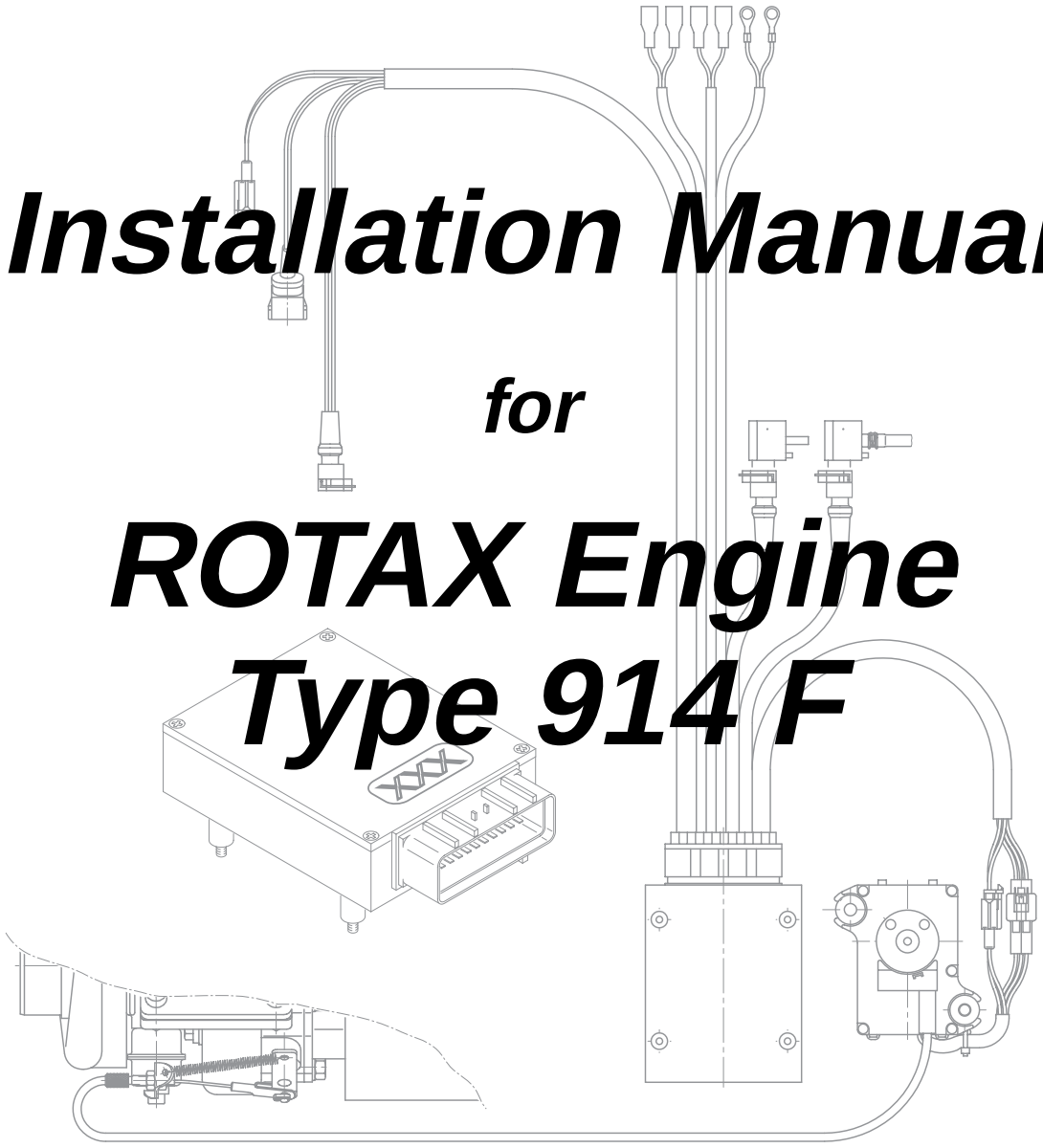
ROTAX®

AIRCRAFT ENGINES



Installation Manual

for

ROTAX Engine Type 914 F

⚠ WARNING

Before starting with the engine installation, please, read the Installation Manual completely as it contains important safety-relevant information. Failure to do so may result in **personal injuries including death.**

Edition: 0 of 1996 05 10

Approval of translation to best knowledge and judgement - in any case the original text in German language is authoritative.

Recommended price: ATS 200,--
Part no.: 897 816 DM 28,--

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5) List of the current pages

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6) Table of amendments

no.	chapter	page	date of change	remark for approval	date of approval from authority	date of inclusion	signature
0	0-25	1-101	1996 05 10	not required		1996 05 10	KD/Me
1	1,5,6,	2,14,15	2004 07 01	not required			
	12	32,32A,32B					
	25	99,100,101					

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7) Description of design

7.1) Designation of type

Basic type

e.g. ROTAX 914 F2:

F2: with prop flange for fix pitch propeller

F3: with prop flange with drive of hydraulic governor for constant speed propeller

F4: with prop flange for fix pitch propeller, but prepared for retro-fit of hydraulic governor for constant speed prop

Optional extras to the above stated basic type:

◆ NOTE: Conversion of the types F2 / F4 to type F3 may be accomplished by the manufacturer (BOMBARDIER-ROTAX).

	external alternator	vacuum pump	drive for rev-counter/ hour meter
for F2	yes	yes	yes
for F3	yes	no	yes
for F4	yes	yes	yes

7.2) Standard engine design

- 4 stroke, 4 cyl. horizontally opposed, spark ignition engine with turbo charger, single central camshaft hydraulic tappets - push rods - OHV
- liquid cooled cylinder heads
- ram air cooled cylinders
- dry sump, forced lubrication
- dual ignition of breakerless, capacitor discharge design
- 2 constant depression carburetors and airbox
- 2 electric fuel pumps (12V DC)
- prop drive via integrated gear box with torsional shock absorber and overload clutch
- stainless steel exhaust system
- engine suspension frame
- expansion tank (coolant)
- electric starter
- integrated AC generator with external rectifier regulator (12V 250 W)
- oil tank
- external start relay
- hydraulic governor for constant speed prop: (**optional** extra) (on F3 only)
- external alternator (**optional** extra) (12V 40A DC)
- vacuum pump (**optional** extra) (feasible on F2 and F4 only)
- drive for rev-counter / hour-meter (**optional** extra)

12.2) Operating Limits

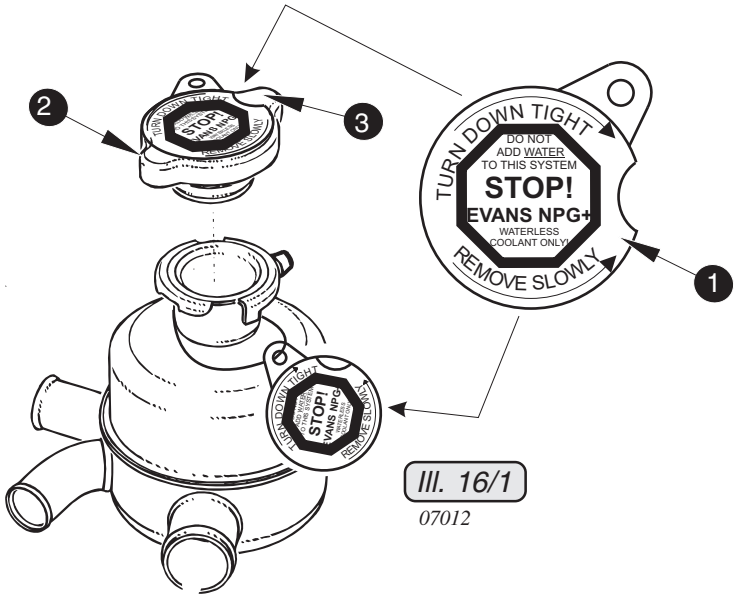
The operating limits (max. permissible cylinder head temperature) are dependent on the engine design but also essentially on the coolant used.

The hottest measuring point (cylinder 2 or 3) is to be specified by testing. For this purpose, see section 7.3 Engine Views. This is dependent on the installation (pulling or pushing propeller design).

The coolant to be used is defined clearly in the Operators Manual. Depending on the installation conditions, conventional coolants can also be used. The provision of proof about the max. reachable cylinder head temperature and thus the coolant to be used is the responsibility of the airplane manufacturer in regard to 12.2.1 and 12.2.2

■ CAUTION: The coolant to be used and its concentration is to be communicated in written form to the owner.

◆ NOTE: From ROTAX® a warning sticker is to be delivered for the water-free coolant which is mounted separately on the expansion tank. When using this coolant, the warning sticker is to be mounted on the radiator cap in such a manner prior to delivery that the opening pressure (3) applied on the radiator cap remains visible. For this purpose, see fig. 16/1.



Ill. 16/1
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1 Warning sticker

2 Radiator cap

3 Excess-pressure information of radiator cap

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12.2.1) Water-free Coolant

- max. permissible cylinder head temperature
  see Operator's Manual section 10.1) Operating Limits.
- Coolant
  see Operator's Manual section 10.2.1) Coolant.

12.2.2) Conventional Glycol / Water Coolant Mixture

The boiling point of conventional glycol / water coolant concentrate depends on the mixture ratio and on the system pressure, i.e. radiator cap.

Corresponding to the following table, the max. permissible cylinder head temperature is limited depending on the coolant concentrate used and may not be exceeded.

radiator cap	max. permissible cylinder head temperature
0.9 bar (13psi)	115 °C (239 °F)
1.2 bar (17.5psi)	120 °C (248 °F)

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During exclusive operation within the max. permissible cylinder head temperature, the following coolant can be used in the corresponding mixture ratio:

	Mixture ratio %**	
Description	**concentrate**	**water**
BASF Glysantine Anticorrosion*	50	50

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* or equivalent

** 50% antifreeze concentrate and 50% pure water, or an equivalent premixed liquid

■ CAUTION: The antifreeze (frost protection) of this mixture is to be observed according to the manufacturer's specifications.

■ CAUTION: The correct mixture ratio is to be observed since otherwise the coolant can thicken and as a result can lead to damages to the cooling system.

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11.1) Operating limits

Exhaust gas temperature:

max.	950° C	(1740 ° F)
normal	900° C	(1650 ° F)

Reading taken approx. 70 mm (2,75 in.) after exhaust flange.

12) Cooling system

12.1) Description of the system

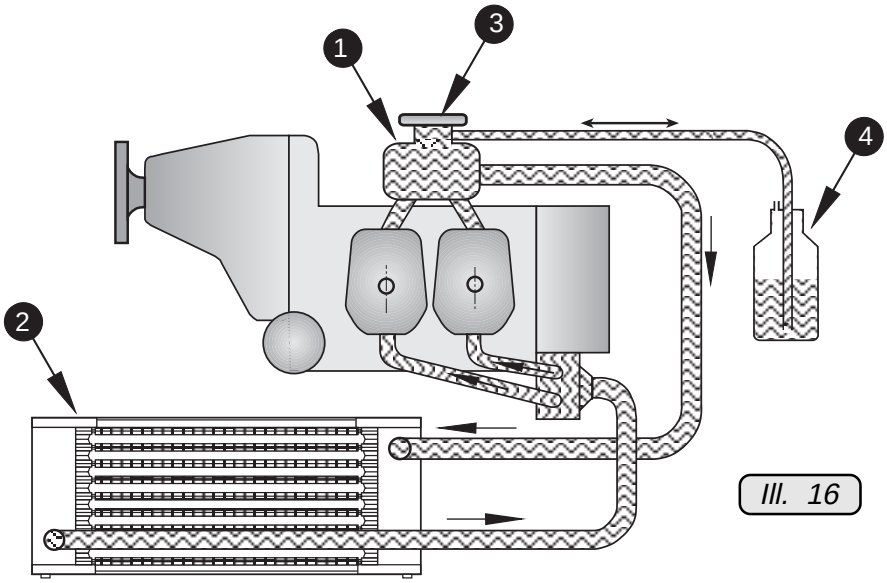
See ill. 16.

The cooling system of the ROTAX 914 F is designed for liquid cooling of the cylinder heads and ram-air cooling of the cylinders.

The cooling system of the cylinder heads is a **closed** circuit with an expansion tank.

The coolant flow is forced by a water pump, driven from the camshaft, from the radiator to the cylinder heads. From the top of the cylinder heads the coolant passes on to the expansion tank ❶. Since the standard location of the radiator ❷ is below engine level, the expansion tank located on top of the engine allows for coolant expansion.

The expansion tank is closed by a pressure cap ❸ (with excess pressure valve and return valve). At temperature rise of the coolant the excess pressure valve opens and the coolant will flow via a hose at atmospheric pressure to the transparent overflow bottle ❹. When cooling down, the coolant will be sucked back into the cooling circuit.



Ill. 16

The shape, size and location of one or more radiators depend mainly on the space available.

No provision is made for attachment of the radiator(s) on the engine.

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25) ROTAX Authorized Distributors for Aircraft Engines

See current issue of Operator's Manual section 14 or in the Internet on the official website **www.rotax-aircraft-engines.com**.

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